AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

1. (Currently amended) A method for non-invasively measuring ~~non-invasive blood pressure measurement~~ arterial blood pressure at a human wrist, said method comprising the steps of:

a) keeping [[the]] a wrist of a patient at a posture which can lower [[the]] a position of ~~the tendons~~ at least one tendon of the wrist near to [[the]] a radial artery to be measured, and cause the radial artery to be close to [[the]] a radius of the wrist;

b) applying a changing external pressure to the skin above the radial artery ~~on the wrist~~;

c) detecting ~~the change of~~ a pulse wave signal of the radial artery along with [[the]] a change [[of]] in said external pressure;

d) measuring [[the]] blood pressure of the radial artery by measuring said [[the]] external pressure applied to [[of]] the radial artery when said pulse wave signal ~~appearing specifically change~~ changes.

2. (Currently amended) The method as defined in claim 1, wherein said step of keeping the wrist at said posture forms an angle between approximately 100 and 170 degrees, said angle between [[the]] a dorsal side of the wrist and [[the]] a dorsal side of the hand ~~of 100~170 degrees~~.

3. (Currently amended) The method as defined in claim 1, wherein said step of keeping the wrist at said posture forms an angle between [[the]] a dorsal side of the wrist and [[the]] a dorsal side of the hand of ~~100~170~~ between approximately 100 and 170 degrees, and synchronously forms a turning angle of the wrist relative to the forearm of ~~30~100~~ between approximately 30 and 100 degrees towards [[the]] a medial side of body.

4. (Currently amended) The method as defined in claim 1, wherein said step of keeping the wrist at said posture forms an angle between [[the]] a dorsal side of the wrist and [[the]] a dorsal side of the hand of ~~100~170~~ between approximately 100 and 170 degrees, and synchronously forms a deflecting angle from [[the]] a central line of the palm

[[hand]] relative to the central line of [[the]] ~~a palmal~~ volar side of the wrist at ~~10-40~~ between approximately 10 and 40 degrees towards the little finger[[;]].

5. (Currently amended) The method as defined in claim 1, wherein said step of keeping the wrist at said posture forms an angle between [[the]] a dorsal side of the wrist and [[the]] a dorsal side of the hand of ~~100-170~~ between approximately 100 and 170 degrees, and synchronously forms a turning angle of the wrist relative to [[the]] a forearm of ~~30-100~~ between approximately 30 and 100 degrees towards [[the]] a medial side of body, and a deflecting angle from [[the]] a central line of the [[hand]] palm relative to [[the]] a central line of [[the]] ~~a palmal~~ volar side of the wrist at ~~10-40~~ between approximately 10 and 40 degrees towards the little finger.

6. (Currently amended) The method as defined in claim 1, wherein said step of detecting ~~the change of~~ [[the]] a pulse wave signal of the radial artery ~~is carried out by measuring the variation of~~ includes measuring an oscillation in said external pressure ~~of the radial artery~~ caused by [[the]] a pulsation of the radial artery ~~in the wrist~~.

7. (Currently amended) The method as defined in claim 1, wherein said step of detecting ~~the change of~~ [[the]] a pulse wave signal of the radial artery ~~is carried out by measuring the change of~~ includes measuring an oscillation in volume of the radial artery at a site which is on the skin above the radial artery and ~~wrist that is~~ within ~~the pressure~~ a compressing area of said external pressure.

8. (Currently amended) The method as defined in claim 1, wherein said step of detecting ~~the change of~~ [[the]] a pulse wave signal of the radial artery ~~is carried out by measuring the change of~~ includes measuring an oscillation in volume of the radial artery at a plurality of sites ~~on the wrist that are within the pressure area~~ which are on the skin above the radial artery and within a compressing area of said external pressure, and selecting one optimal measuring site, and then outputting ~~the optimal pulse signal by using~~ the volume ~~change of the pulse signal~~ oscillation measured at said optimal measuring site as an optimal pulse wave signal.

9. (Currently amended) The method as defined in claim 8, wherein ~~there are~~ said plurality of sites includes at least 2 columns and 2 lines of measuring sites along directions that are parallel and vertical to the radial artery respectively; said step of selecting one optimal measuring site comprising the steps of:

a) selecting a column of measuring sites from all columns of measuring sites, said this column of measuring sites having a feature that ~~where~~ the pulse wave signals detected at this column of measuring sites all possess [[the]] maximum ~~oscillation~~ amplitude points when said external pressure is close to the ~~during the change of the bladder pressure within the range between a lower limit below the possible mean blood pressure and an upper limit above the possible systolic blood pressure of the subject, the amplitude during the maximum oscillation being the largest comparing with the amplitude of the pulse signal detected from~~ mean blood pressure of the patient, and amplitude values of the maximum amplitude points of the pulse wave signals detected at this column of measuring sites being larger than those detected at other columns of measuring sites;

b) selecting [[an]] one optimal site from the selected column of measuring sites, said this measuring site having a feature that ~~where~~ the pulse wave signal detected at this site possess[[es]] ~~an amplitude~~ a point close to disappearance ~~during bladder~~ when said external pressure ~~which is higher than the~~ is close to systolic blood pressure ~~corresponding to the maximum amplitude of the pulse signal, and the bladder pressures corresponding to the maximum and the disappearance of the pulse signal detected at the site are the lowest compared with the bladder pressures~~ of the patient, and the two external pressure values respectively corresponding to the maximum amplitude point and ~~the~~ a disappearance point of the pulse wave signal detected at this measuring site are lower than those detected at other sites of the selected column of measuring sites.

10. (Currently amended) The method as defined in claim 8, further comprising displaying ~~wherein the~~ a position of said [[the]] optimal measuring site ~~in the pressure~~ within the compressing area of [[the]] said external pressure ~~bladder is displayed visually~~, so that an operator can adjust [[and the]] a position of ~~the bladder is adjusted~~ said external pressure according to ~~the display~~ said displaying step ~~so that the optimal site is positioned in the~~

~~center of the pressure bladder~~ to cause a center of said external pressure to correspond to said optimal measuring site.

11. (Currently amended) The method as defined in claim 8, ~~wherein an automatic check is carried out to make sure that the optimal site is in~~ further comprising the step of automatically checking whether the center ~~of the pressure bladder, such that if the optimal site shifts away from the center of the pressure bladder,~~ said external pressure corresponds to said optimal measuring site, and giving a warning signal ~~is given~~ when the center of said external pressure does not correspond to said optimal measuring site, so as to prompt an operator to readjust the position of [[the]] said external pressure ~~bladder~~.

12. (Currently amended) The method as defined in claim 1, wherein said step of measuring the blood pressure of the radial artery ~~is carried out according to the oscillometric method to intermittently measure the mean~~ includes intermittently measuring the blood pressure~~, systolic blood pressure and diastolic blood pressure~~ of the radial artery according to an oscillometric method.

13. (Currently amended) The method as defined in claim 1, wherein said step of measuring the blood pressure of the radial artery ~~is carried out according to the process of the vascular unloading method to continuously measure the instantaneous~~ includes continuously measuring the blood pressure of the radial artery according to vascular unloading method.

14. (Currently amended) The method as defined in claim 1, wherein said step of measuring the blood pressure of the radial artery ~~is exchargeably carried out either according to the process of oscillometric method to intermittently measure the mean blood pressure, systolic blood pressure and diastolic blood pressure, or according to the process of the vascular unloading method to continuously measure the instantaneous blood pressure of radial artery~~ includes at least one of intermittently measuring the blood pressure of the radial artery according to oscillometric method and continuously measuring the blood pressure of the radial artery according to vascular unloading method.

15. (Currently amended) The method as defined in claim 1, wherein said step of applying changing external pressure to the radial artery, and ~~said step of~~ detecting the ~~change of~~ pulse wave signal of the radial artery so as to measure the blood pressure of the radial artery[[,]] can be switched to become applying changing external pressure to [[the]] an ulnar artery of the wrist, and detecting ~~the change of~~ the pulse wave signal of the ulnar artery so as to measure [[the]] a blood pressure of the ulnar artery.

16. (Currently amended) The method as defined in claim 15, further comprising ~~using the results of the blood pressure measurement of the radial artery to calibrate the results of blood pressure measurement of the ulnar artery~~ the step of calibrating the measured ulnar artery blood pressure according to the measured radial artery blood pressure.

17. (Currently amended) A non-invasive ~~blood pressure measurement apparatus comprising~~ apparatus for measuring arterial blood pressure at a human wrist comprising:

a) a wrist holding device for keeping ~~the~~ a patient's wrist at a posture which can lower ~~the~~ a position of ~~the tendons~~ at least one tendon of the wrist near ~~to the~~ a radial artery to be measured, and cause the radial artery to be close to ~~the~~ a radius of the wrist;

b) a pressure bladder for applying an external pressure to the radial artery ~~on the wrist~~, and a pressure bladder holding device for ~~retaining the position of~~ stably positioning said pressure bladder on the skin above ~~relative to~~ the radial artery ~~unchanged~~;

c) a pulse transducer for detecting ~~the~~ a pulse wave signal of the radial artery; and

d) a pressure feeding-measuring system connected to said pressure bladder and said pulse transducer; said pressure feeding-measuring system ~~includes, at least,~~ including a pressure feeding device for feeding [[the]] pressure to said pressure bladder, and a signal processing device for processing the detected pulse wave signal of the radial artery and controlling said pressure feeding device, so as to measure [[the]] blood pressure of the radial artery by measuring [[the]] said external pressure [[of]] applied to the radial artery when the detected pulse wave signal of the radial artery changes.

18. (Currently amended) The apparatus as defined in claim 17, wherein said wrist holding device [[is a]] includes a curved board and several straps; said curved board made of a rigid material ~~with high rigidity, its length and width covering at least the dorsal side of the hand, the dorsal side of the wrist joint, the dorsal side of the wrist, and the dorsal side of the forearm close to the elbow;~~ and having a curved shaped adapted to cover at least a portion of a dorsal side of a hand, wrist joint, wrist, and forearm, said several straps made of non-extensible material, each strap being fixed onto the curved board by non-extensible device for stably holding the forearm, wrist and hand of the patient to the curved board.

19. (Currently amended) The apparatus as defined in claim 18, wherein the shape of said curved board forms an angle between approximately 100 and 170 degrees ~~angle between the dorsal side of the wrist and the dorsal side of the hand of between 100~170 degrees~~ adapted to orientate the dorsal side of the wrist and the dorsal side of the hand, ~~and~~ forms a turning angle between approximately 30 and 100 degrees ~~of the wrist relative to the forearm of between 30~100 degrees~~ adapted to turn the wrist relative to the forearm and towards [[the]] a medial side of body, and also forms a deflecting angle between approximately 10 and 40 degrees adapted to deflect a central line of the hand relative to a central line of the volar side of the wrist towards the little finger ~~from the central line of the hand relative to [[the]] central line of the palmal side of the wrist at 10~40 degrees towards the little finger~~.

20. (Currently amended) The apparatus as defined in claim 18, wherein [[the]] thickness of said curved board is increased in [[the]] a part covering the dorsal side of the wrist joint, so as to eliminate [[the]] a difference between [[the]] diameters of the wrist joint section and that of the middle part of the forearm, and to fill [[the]] a sinking surface of the dorsal side of wrist joint part due to the hand bending to a regular column surface.

21. (Currently amended) The apparatus as defined in claim 17, wherein said pressure bladder and said bladder holding device are integrated into a whole, to form a strap embedded with said pressure bladder; said pressure bladder possess a compressing wall which faces the skin above the radial artery of the wrist; said compressing wall ~~said strap~~ is made [[of]] with a resilient ~~matenal, and~~ membrane shaped [[in]] to upheave towards the

wrist; said strap is made of a material with higher rigidity and slight elasticity, and shaped into a ring ~~shape, the diameter of which is~~ with an elliptic cross section similar to that of the wrist, and two ends of an opening of said strap ~~opened at the back side of the wrist~~ are connected by non-extensible means~~; the wall of said pressure bladder which closes to the wrist is made with a resilient membrane shaped to upheave towards the wrist~~.

22. (Currently amended) The apparatus as defined in claim 17, wherein said pulse transducer ~~for detecting the pulse signal of the radial artery~~ is a pressure transducer [[, the]] having a pressure sensing surface [[is]] connected to said pressure bladder by at least one of air [[or]] and liquid.

23. (Currently amended) The apparatus as defined in claim 17, wherein said pulse transducer ~~for detecting the pulse signal of the radial artery~~ is a volume transducer; said volume transducer is preferably [[being]] a reflective photoelectric transducer that consists of at least one light emitting device and at least one photoelectric device, said light emitting device and said photoelectric device are arranged vertical to the radial artery, [[the]]

wherein a midpoint of ~~the two kinds of devices~~ said at least one light emitting device and said at least one photoelectric device corresponds to an area [[the]] center of said compressing wall of said pressure bladder [[wall]], and ~~the two kinds of devices~~ said at least one light emitting device and said at least one photoelectric device are fixed on ~~the inside of the~~ an inner surface of said compressing wall of said pressure bladder ~~which closes to the wrist~~.

24. (Currently amended) The apparatus as defined in claim 17, wherein said pulse transducer ~~for detecting the pulse signal of the radial artery~~ is a volume transducer array; said volume transducer array is preferably [[the]] a reflective photoelectric transducer array ~~that consists~~ consisting of ~~many~~ a plurality of light emitting devices and ~~many~~ a plurality of photoelectric devices which output [[the]] independent pulse signals respectively~~, there are at least two~~ ;said photoelectric devices are arranged ~~both parallel to and vertical to the radial artery respectively in the~~ preferably to form a rectangular array, ~~said light emitting~~ in which there are at least two photoelectric devices ~~are arranged around the photoelectric device~~ in a line and a column of the array respectively; said light emitting devices are

arranged preferably around said photoelectric device array; [[the]] a center of said photoelectric device array corresponds to ~~the~~ an area center of said compressing wall of said pressure bladder; ~~wall, and the two kinds of~~ said light emitting devices and photoelectric devices are fixed on ~~the inside of the~~ an inner surface of said compressing wall of said pressure bladder ~~which closes to the wrist~~; each output of the photoelectric devices of [[the]] said photoelectric device array are respectively connected to [[the]] corresponding input of an optimal site selector to select [[the]] an optimal measuring site.

25. (Currently amended) The apparatus as defined in claim 24, wherein said optimal site selector selects the optimal measuring site according to the steps of:

a) selecting a column of transducers from all columns of transducers, ~~in which~~ said selected column of transducers having a feature that the pulse ~~signal~~ wave signals detected ~~possesses the maximum oscillation during the change of bladder pressure,~~ by this column of transducers all possessing maximum amplitude points when said bladder pressure is close to mean blood pressure of the patient, and [[the]] amplitude ~~during the maximum oscillation is the largest compared with the amplitude of the pulse signal~~ values of the maximum amplitude points of the pulse wave signals detected by this column of transducers being larger than that detected [[from]] by other column of transducers;

b) selecting [[an]] one optimal transducer from the selected column of transducers ~~which detected the pulse signal possessing an amplitude~~ , said selected transducer having a feature that the pulse wave signals detected by this transducer possess a point close to disappearance ~~which the~~ when said bladder pressure is ~~higher than the pressure corresponding to the maximum amplitude of the pulse signal, and the bladder pressures corresponding to the maximum and the disappearance of the pulse signal detected at the transducer are the lowest compared with the bladder pressures corresponding to the maximum and the disappearance of the pulse signal~~ close to systolic blood pressure of the patient, and the two bladder pressure values corresponding respectively to the maximum amplitude point and the disappearance point of the pulse wave signal detected by this transducer are lower than those detected by other transducers of the selected column of transducers.

26. (Currently amended) The apparatus as defined in claim 24, further comprising ~~an optimal site displaying device, wherein said optimal site displaying device is controlled~~ a device for displaying transducer position to indicate ~~the exact~~ a detailed position of the optimal [[site]] transducer in said ~~pressure bladder wall facing the wrist~~ photoelectric device array.

27. (Currently amended) The apparatus as defined in claim 24, further comprising ~~an optimal site~~ a warning device of transducer position to issue a warning signal[[s]] when ~~the optimal site shifts away from~~ position of said optimal transducer does not correspond to the center of said ~~pressure bladder wall facing the wrist~~ photoelectric device array.

28. (Currently amended) The apparatus as defined in claim 17, wherein said pressure feeding-measuring system ~~comprises the pressure feeding device and the signal processing device used for intermittently measuring the mean~~ is capable of intermittently measuring the blood pressure~~, systolic blood pressure and diastolic blood pressure~~ of the radial artery according to ~~the process of the~~ oscillometric method.

29. (Currently amended) The apparatus as defined in claim 17, wherein said pressure feeding-measuring system ~~comprises the pressure feeding device and the signal processing device used for continuously measuring the instantaneous~~ is capable of continuously measuring the blood pressure of the radial artery according to ~~the process of the~~ vascular unloading method.

30. (Currently amended) The apparatus as defined in claim 17, wherein said pressure feeding-measuring system ~~comprises the pressure feeding device and the signal processing device used for~~ is capable of both intermittently measuring ~~intermittently measuring the mean~~ the blood pressure~~, systolic blood pressure and diastolic blood pressure~~ of the radial artery according to ~~the process of the~~ oscillometric method [[,]] and ~~continuously measuring the instantaneous~~ continuously measuring the blood pressure of the radial artery according to ~~the process of the~~ vascular unloading method [[,]]; said apparatus ~~also comprising~~ further comprising a switching device ~~to switch the connection of said pressure feeding device and said signal processing device according to the requisition of blood pressure measurement~~

for controlling said pressure feeding-measuring system to intermittently measure the radial artery blood pressure according to the oscillometric method and to continuously measure the radial artery blood pressure according to the vascular unloading method.

31. (Currently amended) The apparatus as defined in claim 17, further comprising a pressure bladder adapted to be positioned on the skin above an ulnar artery of the patient for applying external pressure to the ulnar artery ~~that may be placed on the wrist skin over the ulnar artery~~,

a pulse transducer for detecting the pulse wave signal of the ulnar artery, and

a switching device for switching the two pressure bladders and pulse transducers to measure either radial arterial blood pressure or ~~radial~~ ulnar arterial blood pressure.

32. (Currently amended) The apparatus as defined in claim 17, further comprising a calibrating device for ~~using the results of radial arterial blood pressure to calibrate the results of radial arterial blood pressure~~ calibrating the measured ulnar artery blood pressure according to the measured radial artery blood pressure.